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**TITLE: METHOD AND APPARATUS FOR A COMMERCIAL COMPUTER  
NETWORK SYSTEM DESIGNED TO FACILITATE PURCHASES  
OF DIGITAL IMAGES AND THEIR VARIATIONS**

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**METHOD AND APPARATUS FOR A COMMERCIAL COMPUTER  
NETWORK SYSTEM DESIGNED TO FACILITATE PURCHASES  
OF DIGITAL IMAGES AND THEIR VARIATIONS**

**DESCRIPTION**

**Background of the Invention**

**1. Field of Invention**

The method and apparatus of the present invention relate to the purchase of digital  
5 images and their pre-modified variations using electronic computer networks.

**2. Background**

Digital images are widely sold and purchased today. These stock images provide  
even the novice designer with the tools to produce advertisements, marketing and sales materials,  
web pages, brochures, catalogs, home projects, etc. They avoid the cost and time associated with  
10 employing an artist to create an image based on particular specifications.

There are several businesses today which sell stock digital images through  
commercial computer network systems. These businesses use a method by which a purchaser gains  
access to their web site and searches for or requests a digital image of a particular type of object,  
person, animal, scene, etc. Typically, upon entering a search, the purchaser is presented with a choice  
15 between several different images of the same type of subject. For example, the purchaser may  
request an image of an eagle. The business will provide the purchaser with various different images  
of eagles. Often, a purchaser is unable to find a digital image that precisely meets his or her  
particular desires or needs for an intended purpose. Thus, the purchaser is faced with using an  
unsuitable image or is faced with the task of further manipulating the image to obtain an image

perfectly suited for his/her intended purpose. For example, after purchasing the digital image of one particular eagle, the purchaser may modify the digital image of the eagle (a computer image file) to appear as an oil painting, a black and white photo, or a line drawing of the eagle using one or more commercially available software tools on his own computer. This means that the purchaser must still  
5 spend additional time, money, and artistic effort modifying the digital image to meet specific needs.

The method of purchasing, then manipulating stock digital images described above, used by businesses today, does not offer purchasers pre-modified variations of the same base digital image. The purchaser must either accept one of the displayed base digital images as is, or spend time and money to alter it to fit his/her particular specifications or aesthetic desires.

The applicant is unaware of the existence of any commerce system which addresses the above-described shortcomings in the prior art. No programs exist which connect these various tools into a single matrix. Therefore, it is one object of the present invention to set forth an apparatus and business method that offers the capability for purchasers to view a plurality of pre-modified variations of many base digital images, in order to find the variation that most exactly suits the purchaser's needs so that he/she does not have to spend significant additional time, money, or  
15 creative effort making modifications.

Accordingly, it is an object of the present invention to provide a method and apparatus for purchasers of digital images to view a number of variations or presentation forms of the same base image, in order to select an image that perfectly suits purchasers' needs so that it does  
20 not require further content modification.

More particularly, it is an object of the present invention to provide purchasers of digital images with pre-modified variations of an original user-chosen base digital image. Such pre-

selected variations may permissibly include, but are not limited to: black and white drawings, pencil drawings, line drawings, pastels, filtered versions, phase shifted versions, special effect collage versions, French impression, oil painting, watercolor, embossed charcoal, chromed liquid, multiple super-imposition effects, vector drawing, three-dimensional textures, etc. Of course, each pre-modified version of each base digital image can be further artistically enhanced or modified by the purchaser either at the provider's web site using additional tools supplied by the provider, or using the purchaser's own tools. For example, the provider may provide tools which allow the content of the selected image to be further modified, corrected, intensified, edited, cropped, resized, rotated, framed, edged, etc.

A first advantage of a presently preferred embodiment is the capability of a purchaser to access, search through and acquire various digital images to be used for marketing, advertising, brochures, catalogs and various other business and home needs.

A second advantage of a presently preferred embodiment is the capability of a purchaser to access available pre-modified variations of each base digital image in a matter of seconds. The pre-modified variations of the base digital images do not have to be manipulated or revised, saving the purchaser both time and money.

Another advantage of a presently preferred embodiment is the capability of a purchaser to modify even the pre-modified variation of the base digital image.

Additional objects and advantages of the invention will be set forth in part in the following description or may be obvious from the description, or may be learned through practice of the invention.

## SUMMARY OF THE INVENTION

The present invention recognizes and addresses the foregoing disadvantages, and others, of prior art apparatus and business methods.

The present invention uses a business method whereby a user or purchaser first  
5 accesses a web site. Next, they view one or more galleries of base digital images by browsing through them or entering a search query to find images of a certain subject. Each gallery contains a wide variety of base digital images ranging from people, animals, plants, scenery, signs, to inanimate objects. Alternatively, users may directly request a certain digital image without viewing the entire gallery.

After performing a search, users are provided with one or more base digital images  
10 satisfying the search criteria (i.e., containing the requested subject matter). For each base digital image in each gallery there are a plurality of corresponding pre-selected digital images, referred to as derivative images, which are variations of the base digital image which have been pre-created from the base image and stored for later retrieval. Upon selection of the desired base digital image,  
15 the user is then presented with a plurality of the available pre-modified variations of that base digital image. The user can then choose one or more of the pre-modified variation images which most precisely satisfies the user's needs. These pre-modified variations are preselected, created and stored or maintained in one or more digital image galleries by the web site proprietor so that they are  
20 available to the user within seconds of his selection of a single base image. No further processing of the base digital image is needed to generate the various corresponding derivative images when the base image is chosen by the user. The derivative image choices may range from the base image modified to appear as a simple pencil drawing or an oil painting, or even non-conventional

derivations of the base image such as those derivative images created with certain filtering effects or multiple super-imposition effects.

After selecting the desired digital image, which may include the original base digital image or any of its derivative images, the user indicates to the proprietor that he or she wishes to purchase the selected digital image. This transaction is accomplished through an E-commerce transaction of any of the types known in the art. After purchasing one or more digital images, the digital image can then be printed, downloaded to the user's computer, disk or CD, or ordered for delivery on a disk or CD or even in a hard copy.

In a preferred embodiment of the present invention, after selecting a derivative image, users then are given the option of selecting one or more of several special effect tools whereby the digital image can be further modified or manipulated to meet particular needs, though the goal of the present method is to avoid the need for further manipulation to the greatest extent possible. Such tools or modifications may include, but are not intended to be limited to, further intensifying or shading of the image, or cropping, resizing, rotating, framing or edging the image.

It is a goal of the present invention to provide a robust system which allows users to search, instantly access, preview and purchase base digital images and/or a number of pre-selected and pre-created derivative images. Users are able to gain access to original artistic images with little time and expense. Users can eliminate the need for their own creative efforts or the expense of hiring an artist to create an original image. Within a few moments, the present invention enables users to select, purchase and receive a digital image which better fits their precise need than those images currently available through existing stock photography web sites.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is a block diagram illustrating a preferred embodiment of central controller

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Figure 2 is a block diagram illustrating a preferred embodiment of purchaser interface

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Figure 3 illustrates the process by which a user selects and purchases one or more digital images.

## **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Reference will now be made in detail to the presently preferred embodiment of the invention. It will be apparent to those skilled in the art that modifications and variations can be made in the present invention without departing from the scope or spirit thereof. Thus, it is intended that the present invention covers such modifications and variations as come within the scope of the appended claims and their equivalents.

In a preferred embodiment, the present invention includes one or more web-accessible digital image databases that make numerous digital images of various subjects available for viewing by users. The present invention allows users to access the web site and search a digital image database by subject of the base digital image or by browsing a base digital image gallery. Upon selecting a base image, the user is then presented with a plurality of available pre-modified digital derivative images based on the selected base image. The pre-creation and storage of pre-selected derivative images allows the user to access and view a plurality of variations of the original base image without the additional computer processing time which would otherwise be necessary to create and display the derivatives. The user may be presented with the various derivative images in many

permissible formats, such as one at a time or certain groups at a time. The preferred format, however, is a view which allows the user to view all derivative images at one time in order to aid in comparison. The user simply selects the derivative image desired. Since the pre-selected derivative images are modified and produced ahead of time, they can be accessed instantly.

5 In one preferred embodiment, the user may be given the option of selecting one or more special effect tools through which the user can further intensify, modify, edit, correct, crop, resize, rotate, frame or edge the selected image.

Once the user has selected, or selected and further modified, the desired final digital image, the user may purchase the final digital image. Upon purchase, the user is given a number of delivery options such as printing, downloading or copying the digital image to his computer, a disk, or a CD, or the user may simply order a copy of the image for delivery on disk, CD or hard copy by mail or courier.

The present invention allows a user to browse through or search an image database 31 comprising one or more galleries of base digital images. The base digital images may be searched by subject, such as people, objects, animals, plants, scenery, etc. or, using any other conventional search method. Alternatively, a user may request a specific base digital image if already known, such as by an image number or other organizational identifier. After selecting a specific base digital image to view, the user is presented with or, alternatively, may request to view a plurality of pre-selected and pre-modified variations of the selected base digital image, otherwise known as derivative images.

20 These derivative images are generally further manipulations of the base digital image and include, but are not limited to, black and white drawings, pencil drawings, line drawings, pastels,



filtered versions, phase shifted versions, special effect collage versions, French impression, oil paintings, watercolor, embossed charcoal, chromed liquid, multiple super-imposition effects, vector drawings, three-dimensional textures, etc. For convenience of viewing, the derivative images may be grouped according to category, style or format with the user being given the option of selectively viewing different groupings.

The derivative images for each base digital image of the present invention comprise different versions of the same original base digital image. These derivative images are digital images which might otherwise be created using any of a number of available digital imaging software applications, and will in fact be created by the web site provider through the use of a variety of tools taken from many different software applications. However, the derivative images of the present invention are pre-created by the web site provider so that the results of many different modification techniques from a diverse set of software applications as well as unique artistic modifications by the web site provider are available for the user upon selection of a single base image. Thus, users avoid having to take the base image, purchase each of the different software applications and use the tools available thereon in order to explore the possibilities resulting from a base image. In the present invention, this work is already done and the user can simply avail himself of the fruits of that labor, thereby saving considerable time and expense.

After viewing and selecting one or more derivative image, the user may be given the option to select from one or more special effect tools to further intensify, modify, edit, correct, crop, resize, rotate, frame and edge the selected digital image. Thus, a user is able to find and purchase an image that completely accommodates the desired objective of the user with relative ease.

## System Architecture

The system architecture of a first embodiment of the apparatus and method of the present invention is illustrated in Figs. 1 through 3.

As shown in Figs. 1 & 2 the apparatus of the present invention comprises a central controller 20 and a purchaser interface 50 (collectively the "nodes"). Each node 20, 50 is connected via an Internet connection using a public switched phone network, such as those provided by a local or regional telephone operating company. Connection may also be provided by dedicated data lines, cellular, Personal Communication Systems ("PCS"), microwave, or satellite networks. Purchaser interface 50 is the input gateway for communications with central controller 20.

As shown in Fig. 1, the central controller 20 includes central processor (CPU) 21, cryptographic processor 27, RAM 22, ROM 23, payment processor 24, clock 25, operating system 26, network interface 40, and data storage device 30.

Central controller 20 acts as a web server receiving instructions and orders from users. A conventional personal computer or computer workstation with sufficient memory and processing capability may be used as central controller 20. Central controller 20 must be capable of high volume transaction processing and performing a significant number of database searches. A Pentium microprocessor such as the 100 MHz P54C, commonly manufactured by Intel, Inc, employing a 32-bit architecture or its equivalent may be used for central processor (CPU) 21.

A MC68HC16 micro-controller, commonly manufactured by Motorola Inc., may be used for cryptographic processor 27. Equivalent cryptographic processors may also be used. This micro-controller utilizes a 16-bit multiply-and-accumulate instruction in the 16MHz configuration and requires less than one second to perform a 512-bit RSA private key operation. Cryptographic processor 27 allows for secure transactions. Cryptographic processor 27 may also be configured as

part of CPU **21**. Other commercially available specialized cryptographic processors include VLSI Technology's 33 MHz 6868 or Semaphore Communications' 40 MHz Roadrunner 284. Adequate RAM **22** and ROM **23** are provided to assist in the processing of data.

Payment processor **24** comprises one or more conventional microprocessors, supporting the transfer of payments, charges, or debits, attendant to the method of the apparatus. Payment processor **24** may also be configured as part of CPU **21**. Processing of credit card transactions by payment processor **24** may be supported with commercially available software, such as, for example, the Secure Webserver manufactured by Open Market, Inc. This server software transmits credit card numbers electronically over the Internet to servers located at the Open Market headquarters where card verification and processing is handled. Their Integrated Commerce Service provides back-office services necessary to run Web-based businesses. Services include on-line account statements, order-taking and credit card payment authorization, credit card settlement, automated sales tax calculations, digital receipt generation, account-based purchase tracking, and payment aggregation for low priced services. Clock **25** is a standard chip-based clock which serves to time stamp the transaction.

Data storage device **30** may include hard disk magnetic or optical storage units, as well as CD-ROM drives or flash memory. Data storage device **30** contains digital image database **31**, a database of base digital images and a plurality of corresponding derivative images which have been pre-created from each base digital image. Of course image database **31** may be organized as one or more image galleries or in any convenient way conducive to aiding the user in searching and viewing the base digital images and derivative images. Alternately, image database **31** may contain

only the gallery of base digital images with the pre-modified versions of each base digital image stored in one or more separate databases (not shown).

Additionally, data storage device **30** comprises other databases used in the processing of transactions of the present invention, including purchaser database **32**, payment database **33**,  
5 purchase confirmation database **34**, audit database **35**, contract database **36**, and cryptographic key database **37**. These databases can be created and managed by various software applications, such as Oracle7, manufactured by Oracle Corporation. Data storage device **30** also stores information pertaining to purchaser accounts in purchaser account database **38**.

Purchaser database **32** maintains data on users with fields such as name, address, credit card number, phone number, social security number, electronic mail address, credit history, digital image sold, past system usage, and private information, etc. This information is obtained when the user first purchases digital images, or may be obtained prior to viewing digital images.

Payment **33** database tracks all payments made by the users with fields such as user name, ID number, amount of payment, and digital image purchased. This database may also store credit card numbers of users.

Purchase confirmation database **34** stores and tracks the digital images to be sent to the user and confirms completed transactions. Fields include user name, elected digital images and purchased digital image(s).

Audit database **35** stores transactional information relating to the purchasing of digital  
20 images, allowing them to be retrieved for later analysis.

Contract database **36** keeps track of all sales of digital images, including user's name, method of payment, date, time, and method of receiving digital images. This information is then retrieved in order to satisfy orders by mail.

Cryptographic key database **37** facilitates cryptographic functions, storing both symmetric and asymmetric keys. These keys are used by cryptographic processor **27** for encrypting and decrypting user responses and user payment information.

Purchaser account **38** tracks all information pertaining to the user's account with fields such as user's name, bank and credit account numbers, and debit or credit transactions.

Network interface **40** is the gateway to communicate with user through purchaser interface **50**. Network interface **40** is configured as a web site. Conventional internal or external modems may serve as network interface **40**. Network interface **40** supports modems at a range of baud rates from 1200 upward, but may combine such inputs into a T1 or T3 line if more bandwidth is required. Network interface **40** is connected with the Internet and/or any of the commercial on-line services such as America Online, CompuServe, or Prodigy, allowing users access from a wide range of on-line connections. Several commercial electronic mail servers include the above functionality. NCD Software manufactures "Post.Office," a secure server-based electronic mail software package designed to link people and information over enterprise networks and the Internet. The product is platform independent and utilizes open standards based on Internet protocols. Users can exchange messages with enclosures such as files, graphics, video and audio. The system also supports multiple languages.

While the above embodiment describes a single computer acting as central controller **20**, those skilled in the art will realize that the functionality can be distributed over a plurality of

computers. In one embodiment, central controller **20** is configured in a distributed architecture, wherein the databases and processors are housed in separate units or locations. Some controllers perform the primary processing functions and contain at a minimum RAM, ROM, and a general processor. Each of these controllers is attached to a WAN hub (not shown) which serves as the primary communication link with the other controllers and purchaser interface **50**. The WAN hub (not shown) may have minimal processing capability itself, serving primarily as a communications router. Those skilled in the art will appreciate that an almost unlimited number of controllers may be supported. This arrangement yields a more dynamic and flexible system, less prone to catastrophic hardware failures affecting the entire system.

In an exemplary embodiment, purchaser interface **50** is a conventional personal computer having an input device **59**, such as a keyboard, mouse, or conventional voice recognition software package; a display device, such as a video monitor **60**; a processing device such as a CPU **55**; and a network interface such as a modem **58**. These devices interface with central controller **20**.

Referring now to Figure 2, there is described purchaser interface **50** which includes central processor (CPU) **55**, RAM **52**, ROM **53**, clock **54**, video driver **51**, video monitor **60**, communication port **56**, input device **59**, modem **58**, data storage device **57**, and cryptographic processor **61**. A Pentium microprocessor such as the 100 MHz P54C described above or its equivalent may be used for CPU **55**. Clock **54** is a standard chip-based clock which can serve to time stamp the sale. Modem **58** is preferably high-speed data transfer since most provider responses are not primarily text-based and contain large graphics files. Data storage device **57** is a conventional magnetic-based hard disk storage unit such as those manufactured by Conner Peripherals.

Cryptographic processor 61 may be added for stronger security, particularly for protecting user information such as credit card numbers. If a cryptographic processor is required, the MC68HC16 micro-controller described may be used. The practice of using cryptographic protocols to ensure the integrity of messages is well known in the art and need not be described here in detail.

There are many commercial software applications that can enable the communications required by purchaser interface 50; the primary functionality being message creation and transmission. Eudora Pro manufactured by Qualcomm Incorporated, for example, provides editing tools for the creation of messages as well as the communications tools to route the message to the provider. Since central controller 20 is configured as a web server, conventional communications software such as the Netscape navigator web browser from Netscape Corporation may also be used. The user may use the Netscape Navigator browser to transmit messages to the provider. No proprietary software is required.

#### Preferred Embodiment

Communications with the user take place via electronic networks, with central controller 20 acting as a web server. The user logs on to central controller 20, browses or searches a gallery of base digital images or specifically requests a base digital image subject, views and selects base digital images and then views and selects the desired derivative image of the selected base image. As described above, the user may then modify the selected digital image, purchase the image, perform additional searches for other images or simply disconnect from the web site. This service is made available to users by posting it on the web page of central controller 20.

Fig. 3 illustrates the process by which the user selects and purchases one or more desired digital image(s). At step 1, user logs on to central controller 20 using purchaser modem 58 of purchaser interface 50, establishing a communications link and accessing the site. It should be noted that the user may be an individual, a corporation, a partnership, a government, or any other entity. Central controller 20 has a page on the world wide web, allowing the user to provide information through the interface of conventional web browser software such as Netscape Navigator, manufactured by Netscape, Inc.

At step 2, the user is prompted to search or browse a database of base digital images. Alternately, the user may be provided with the option of specifically requesting a known base digital image or derivative image according to an image classification system (not shown in Fig. 3). The image database 31 (shown in Fig. 1) is organized to facilitate the search and retrieval of base digital images. Any common method of searching and retrieving information and files from a database is suitable to the present invention, such as the preferred searching by subject matter of the image. Detailed referencing of the base images in the database enhances searchability. Suitable search subjects may include, but are not limited to, people, animals, plants, geometric designs, modern art, sculpture, scenery, inanimate objects. Base images falling within each of those classes may be further subclassified within the database to promote accessibility. The search algorithms may also allow modification of the search parameters, such as by specific descriptions of the subjects within each class (e.g., "running man" or "stormy water" or "blue car").

Upon entering a search request, as shown in Fig. 3, the user is provided at step 3 with a display of the search results, a collection of base digital images gleaned from the image database 31 which satisfy the search criteria input by the user. The resulting base digital images are displayed



on the video monitor 60 of purchaser interface 50 (shown in Fig. 2). For convenience of viewing, the digital images may be displayed as “thumbnail images” or miniaturized versions which may be enlarged for further inspection at the user’s discretion. If no digital images satisfy the search criteria, the user is prompted to enter a different search.

5           At step 4, user either selects one of the displayed base digital images or, if no desirable image is found, may return to step 2 and conduct a new search. Upon selection of a base digital image, in step 5 the selected base image and the pre-created derivative images stored in the database corresponding to the selected base digital image are displayed in a convenient format on the video monitor 60 for viewing by the user. As previously described, the derivative images are a plurality of images based upon the original base digital image. The derivative images are created prior to the user’s selection of the base image and are an existing part of the present invention stored in the image database 31. Because all of the derivative images are pre-created and stored in the image database 31, no additional processing time or manipulation of the base image is required to create the various derivative images when the base image is selected by the user. The wide variety of derivative images provided saves the user significant time in having to perform modifications upon the base image at his own expense. Instead, upon the selection of a base image, the user is presented with a plurality of derivative images, one of which may be better suited to the user’s intended end-use than the original base digital image itself.

20           At step 6, user may select or mark either the base image or a derivative image as an elected image which the user desires to purchase. If the user does not find a suitable image, the user may choose to return to either step 3 to review the search results or step 2 to begin a new search. When the user elects to purchase an image, the elected image is stored or tagged for reference as an

elected image in step 7. After storing an elected image, in step 8, the user is prompted to either continue or select additional images by repeating one or more of the foregoing steps of the process.

In one alternative embodiment, after one or more images are stored by the user as elected images, in step 9 the user may be given the option of further manipulating an elected image using one or more special effects tools which may be provided through the web site. Such tools may be any of the myriad existing software applications which may be added on to the web site to allow the user to further modify the elected image to better suit the user's needs, such as by further intensification, modification, editing, correcting, cropping, resizing, rotation, framing and edging the image. Alternately, the availability of special effects tools may be limited until after the user has actually completed the E-commerce transaction of step 11 wherein the elected images are actually purchased. If desired, special effects tools are employed by the user in step 10 and the process of steps 9 and 10 repeated until the user has modified each of the elected images utilizing all of the available special effects tools to create the desired image.

Once user has achieved the desired elected image(s), at step 11 user may continue to complete the purchase of the image(s). The purchasing step 11 is a typical E-commerce transaction which may take many different embodiments, the specifics of which are largely irrelevant to the present invention. In one embodiment, the user clicks on a purchase button at which time a form is displayed on the video monitor 60 of purchaser interface 50. This form is an electronic contract which includes a list or display of the elected image(s), pricing information for the elected image(s) as well as a number of blanks to be filled out by the user, including: name, address, phone number and billing information such as preferred method of payment or credit card number. After filling out the information, user sends this information back to the central controller 20 by clicking on a "send"

button located on the screen in which he entered the above information. Once the payment information has been processed, the user is given complete access to the data of the computer file(s) which comprises the elected image(s) and may print, download to a computer, disk or CD, or have the elected image(s) mailed or otherwise delivered to him/her on disk or CD.

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Referring back to the processing of the payment information, if the payment method is by credit card, the contract is received by the central controller **20** and checked to see that sufficient credit is available to cover the stated price of the image, before the image is made available to the user. The central controller **20** extracts price, credit card number and expiration date information from the electronic contract. The payment processor **24** uses E-commerce mechanisms known in the art to communicate with the credit card clearing house and finalize the credit card purchase.

There are of course many other methods under which payment may be transferred. Purchaser can select his preferred method of payment which may include credit card, personal checks, electronic funds transfer, digital money, etc. Credit card transactions are handled through E-commerce payment mechanisms known in the art. These payment methods are meant to be merely illustrative, however, as there are many equivalent payment methods commonly known in the art which may also be used. If the buyer wants to pay by credit card, for example, payment data would include his credit card account number, expiration date, name of issuing institution, and credit limit. For electronic funds transfer, payment data includes the name of the buyer's bank and his account number. Although the preferred embodiment describes a protocol in which users pay prior to receiving the digital image, other embodiments may be implemented in which payment is delayed until the goods have been received by the user, or delayed until some predetermined date. Partial

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